

Roundup

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Pulling together

On Oct. 14, Expedition 8 Commander Michael Foale (right) and his backup, Bill McArthur, Jr., raise the American flag outside the Cosmonaut Hotel in a traditional ceremony during preparations for the mission's launch. European Space Agency Astronaut Pedro Duque (far left) of Spain and Cosmonaut Alexander Kaleri, Soyuz Commander and Flight Engineer, raise the flags of Spain and Russia. Expedition 8 launched from the Baikonur Cosmodrome in Kazakhstan on Oct. 18 onboard a Soyuz rocket and docked with the International Space Station two days later.

For more Station news, see pages 3 and 8.

From the desk of Lt. Gen. Jefferson D. Howell Jr.

Director's Message



Thanksgiving

Let us all give thanks for the service, dedication and inspiration of:

Rick D. Husband
William C. McCool
David M. Brown
Kalpana Chawla
Michael P. Anderson
Laurel B. Clark
Ilan Ramon

We are very privileged to be part of this special fraternity of men and women who aspire to overcome the awesome barriers to human space exploration. The loss of *Columbia* and its valiant crew is a grim reminder of the stakes involved and the difficulty of our quest.

So let us also give thanks for having the opportunity to emulate their professional excellence, courage and commitment to the noble endeavor that we all are about. Our success will be testimony that their sacrifice was not in vain.

HAPPY THANKSGIVING.

Beak sends...



APPEARING THIS MONTH IN OUR

Guest Space

Dan Carpenter

Director of Public Affairs



Now Actively Seeking to Assist

You, the Johnson Space Center employees, are always our ambassadors to the public – especially during this pivotal time in the history of the space program. While our Administrator and the leadership of our human spaceflight team have the attention of the news media, it is you, those working behind the scenes, who best connect with the American people to share the story of NASA. And what an amazing story we have to tell.

That is where the Public Affairs Office (PAO) comes in. We've always been an organization committed to distributing information, but historically we've focused mostly on the needs of the news media. Taking a step back and looking at the sheer number of you who are out talking about NASA to various audiences, we discovered a need for improved service and products for you.

With this in mind, we've created a customer service Web site to facilitate the use of PAO products and services. We have some new and improved products and services ready for you to use at a moment's notice or with a few days' planning:

- *Inside NASA: An Overview of Johnson Space Center* (PowerPoint)
- *International Space Station: A Laboratory for Discovery* (PowerPoint)
- Videos that inspire and inform
- Exhibits from every era of human spaceflight (advance notice required)
- *ISS Highlights*: A handout with talking points for museum personnel, teachers and others who speak about the International Space Station

To view these products, visit www.jsc.nasa.gov/paointernal (on-site access only).

In addition to self-serve products, you can contact PAO for on-call support and advice as you need it. We offer:

- Talking points
- Response-to-Queries (also known as RTQs)
- Media training

These tools can be used to aid in internal communications campaigns, speeches at community events or when attending a high-profile event on- or off-site.

During the next few months, PAO representatives will be visiting your team meetings to tell you more about how we can help you tell the NASA story. The PAO team is working diligently to be your communications source, so come check us out.

ONENASA

One Team, One Journey, One NASA... Building the Future Together

Johnson Space Center employees packed the Teague Auditorium on Oct. 23 to learn more about the One NASA effort. The all-hands program encouraged all employees to embrace One NASA in principal and practice.

The speakers included Lt. Gen. Jefferson D. Howell, Jr., JSC Director; Frederick Gregory, NASA Deputy Administrator; Dr. Edward Weiler, Associate Administrator for the Office of Space Science; Dr. Julian Earls, Glenn Research Center Director and Johnny Stephenson, One NASA Team Chairperson. There were also videotaped messages from Space Shuttle Program Manager Bill Parsons and International Space Station Program Manager Bill Gerstenmaier.

Earls, who presented an overview of how Glenn interacts with other NASA centers, said that NASA workers from all over the country should pull together to accomplish the Agency's goals.

"Our goal is to inspire the next generation of explorers," he said. "NASA's image is second-to-none to young people."

Parsons also encouraged Agencywide teamwork: "We all need to work together and operate under the concept that we are all on one team. We cannot do this without each other – that is what One NASA is all about."

Read more about the event at <http://www.jsc.nasa.gov/jscfeatures/> and explore the One NASA initiative at www.onenasa.nasa.gov.



Dr. Julian Earls, Glenn Research Center Director, addresses the JSC workforce during the One NASA program Oct. 23.

Photo by James Blair

International Space Station continues operations, mission research

By Linda Singleton

The following is the second in a series of stories on NASA's Return to Flight efforts. This installment focuses on the International Space Station and its readiness for the Shuttle fleet's Return to Flight.

The International Space Station is “ready to fully support the Shuttle missions as soon as they return to flight,” said Mike Suffredini, ISS Operations Integration Manager. In the meantime, the ISS Program Office works around the clock to find solutions to the current challenges of a two-person crew and the highly technical assembly missions that lie ahead.

During a Return to Flight media briefing Sept. 16, Suffredini joined ISS Program Manager Bill Gerstenmaier and ISS Program Scientist Don Thomas to present an overview of their current and future priorities.

In regard to space-based research, Thomas outlined four new research strategies that are now being put into action for the ISS:

- Complete the current experiments onboard the ISS.
- Perform additional experiments on samples that can be reused, enabling the crew to gain additional valuable data for the principal investigators.
- Develop smaller, lighter payloads of fast-track experiments, such as fluid dynamics experiments, which can be launched aboard Russian Progress vehicles.
- Maximize international cooperation. For example, a protein crystal growth experiment (the Granada Crystallization Facility) was developed in Spain with a principal investigator from the Japan Aerospace Exploration Agency. It is contained in a European Space Agency (ESA) facility, and it will be launched on a Russian Soyuz and stored in U.S.-built units.

Now onboard Station, Expedition 8 Commander and NASA ISS Science Officer Michael Foale will oversee more than 200 hours of scientific research with the facilities and samples already on board. Additional experiments are currently being evaluated and prepared to take advantage of the available cargo space on the Progress vehicle.

New United States experiments to be conducted during the Expedition 8 increment include:

- Cell Biotechnology Operations Support system, which is used to grow three-dimensional tissue that retains the form and function of natural living tissue, a capability that could hold insights in studying human diseases, including various types of cancer, diabetes, heart disease and AIDS.
- Education Payload Operations, which include three educational activities that will focus on demonstrating science, mathematics, technology, engineering or geography principles.

- Group Activation Packs - YEAST, which will evaluate the role of individual genes in the response of yeast to space flight conditions. The results of this research could help clarify how mammalian cells grow under microgravity conditions and determine if genes are altered.

When asked how much he thought that the Station's scientific mission would be advanced during Expedition 8, Foale said that he thought it would be “advanced quite significantly; no less than before Columbia.” He called that assertion “a bold statement, but it's supported by the fact that I have many investigations to carry out onboard the Station.”

The primary research objective to take place once the Shuttles return to flight will be the installation of three new research racks in the Destiny Module: Human Research Facility-2 (HRF-2); Minus Eighty Degree Laboratory Freezer for ISS (MELFI), built by ESA; and the Window Observational Research Facility (WORF).

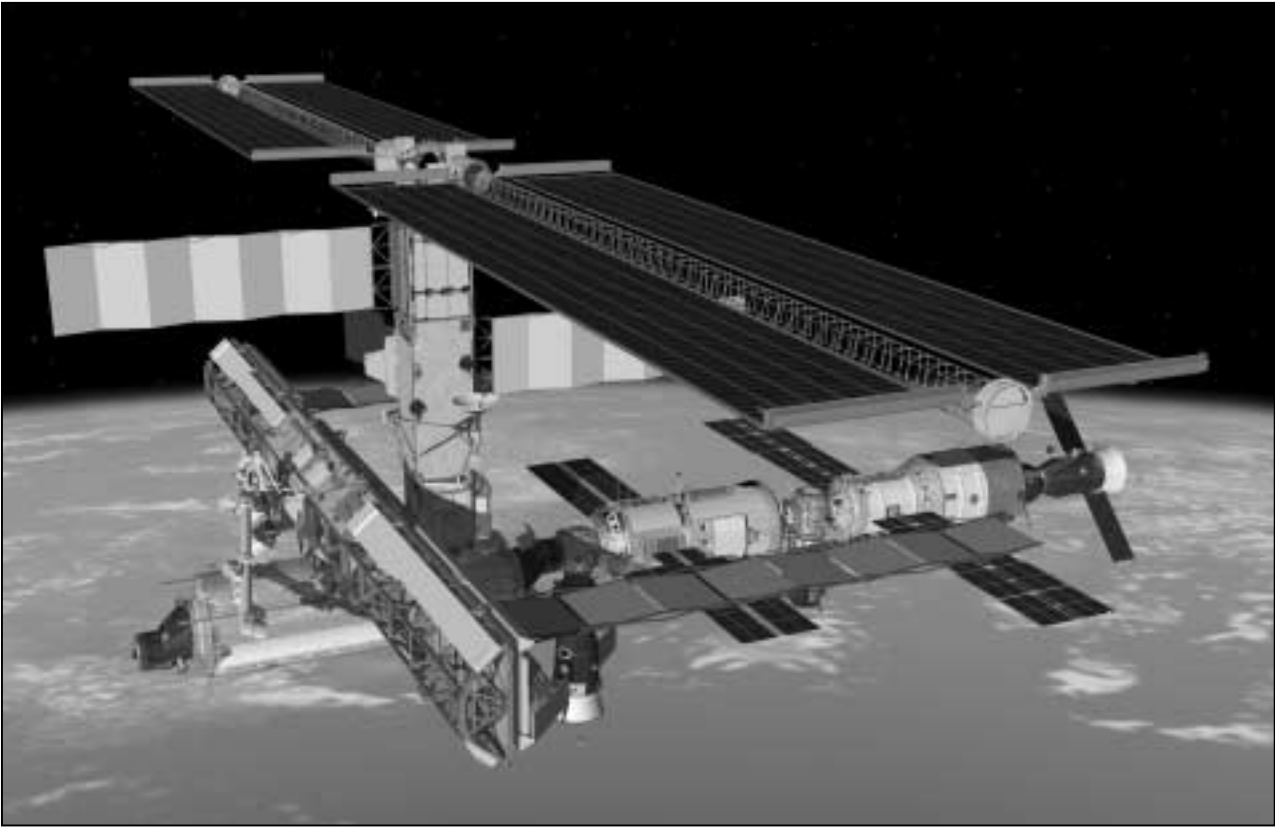
HRF-2 will enable scientists to monitor the mass and weight of crewmembers while on orbit, as well as conduct metabolic studies and monitor pulmonary functions. Data collected from these studies will help them identify the overall effects of long-duration spaceflight. MELFI is a minus 80 degrees Celsius freezer that will retain blood, urine and saliva samples until they can be returned to Earth for further study following each mission. WORF is a world-class window observation facility that eliminates glare – resulting in even better imagery taken from Station – and can be used by researchers on the ground and orbiting crews alike.

In terms of Station assembly, seven flights must be completed before Node 2 can be attached to the ISS. However, Gerstenmaier said no schedule pressures will be placed on the Shuttle program to expedite any of these assembly missions. “The first two Shuttle flights will be focused on getting all the new processes and routines put in order,” he said.

The 12-A.1 assembly mission will be one of the most challenging to date in terms of managing the power and thermal systems. During this mission, the crew will conduct its first-ever major power-down of half of the Station and then initiate a power-up sequence to install and move the massive solar arrays.

Other changes to ISS operations, which are currently being implemented, include separating crew from cargo missions, utilizing more disposable food and storage containers that do not need to be returned to Earth and switching some of the payload mission schedules.

“Overall, we're in very good shape on Station in regard to crew rotation plans, maintenance schedules and consumables,” Suffredini said.



A port-side view of the International Space Station at its current configuration shows resupply vehicle Progress 12 docked to the aft end of the Service Module.

Courtesy of JSC's Visual Communications Lab



The Expedition 8 crew, Flight Engineer Alexander Kaleri (top) and Commander Michael Foale, launched to the International Space Station on Oct. 18.

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Sharing the Vision

Johnson Space Center employees strive every day to deliver NASA's message of exploration to the community, the country and the world. Here are just a few of the creative ways that JSC is sharing the Vision.

NASA's Digital Learning Network brings space back to school

By JSC's Education and Student Program's Branch

LeAnne Torney's class in Titonka, Iowa, recently visited Johnson Space Center. While the students' experience was engaging and interactive, they didn't arrive in Texas on a school bus and didn't even have to pack a lunch. Instead, they visited NASA via the Houston hub of the Agency's Digital Learning Network (DLN).

It was "a wonderful educational experience for my students," Torney said. "It gave them the opportunity to improve communication skills and teamwork skills...as well as relate science content to everyday life."

Using videoconferencing technology, NASA has been reaching out to students and teachers via two-way audio and video connections for years. Each year, various NASA centers combine to produce hundreds of live interactive events with schools around the country, directly impacting thousands of students. When webcasting tools are added, even more students participate in these virtual experiences.

NASA's Office of Education is now working to enhance these existing videoconferencing and webcasting capabilities through the creation of the DLN. The new network will use more powerful and flexible Agencywide connectivity tools, stronger organizational relationships and shared content to broaden

NASA's reach in the educational community and improve the products and services delivered.

"With JSC's DLO, our education events typically focused on human spaceflight since that is what our Center specializes in," said Doug Goforth of JSC's Education Office. "But with the new DLN, all the Centers can work together to reach students in a way that's more in line with the One NASA approach."

Through the network and NASA's other assets, an educator at NASA's Glenn Research Center in Ohio, connected to three schools for a virtual field trip, could share live imagery of astronauts training underwater in Houston or a new aircraft in wind-tunnel testing in Virginia. With minimal overhead, that educator could also enhance a robotics lesson by including a NASA expert live from California.

The DLN is an important step to supporting the changing needs of NASA's education customers and keeping the Agency on the forefront in use of this technology as an education tool. It will truly strengthen NASA's ability to inspire the next generation of explorers through interactive digital experiences, utilize NASA's newly strengthened Web assets at www.nasa.gov and present "One NASA" to students, educators and the general public.



In May, K-12 students at three schools on the Turtle Mountain Indian Reservation (TMIR) in North Dakota had the opportunity to interact with Astronaut John Herrington (shown here with IMPASS Education Specialist Sherri Jurlis) using JSC distance learning technology. In cooperation with Turtle Mountain Community College, NASA installed videoconferencing systems in these tribal schools on the reservation.

Prior to this event, the TMIR was featured in an episode of the NASA CONNECT television show entitled "The Wright Math" that aired nationally on PBS stations in October 2002. Herrington appeared in an introductory segment at the beginning of the program. As a follow-up to the show, JSC employees coordinated with Bob Starr, Manager of the Digital Media Lab at Langley Research Center, to have the same students from the program connect live with Herrington.

The event was "representative of the kind of cooperation needed to make the Digital Learning Network a reality," Starr said.

jsc2003e36295 and jsc2003e36297 (inset)
Photos by Robert Markowitz



NASA Brain Bites

Does your brain need a snack? If so, go find a NASA Brain Bite. This new series aims to give hungry minds a little something to munch on.

"Brain Bites are short videos that answer a frequently asked question or cover an interesting topic related to something NASA does," Dan Carpenter, Director of Public Affairs, said. "We're trying to target it to the 13- to 18-year-old level, as well as general public audiences."



"Through NASA Brain Bites, we also hope to build a long-term relationship with the viewer by encouraging them to visit the NASA portal at www.nasa.gov," Carpenter said.

Brain Bites have included such topics as "How do you turn a bolt in space?" and "How is an astronaut like an air-hockey puck?" Each "bite" is accompanied by grade-appropriate links to related topics – for those whose brains are still hungry.

"What we're trying to do is show kids that rocket science is based on solid and simple scientific principles that they can apply themselves – that the things they're learning in school are applicable, even to rocket science," said Tim Allen, Television Producer with Media Services Corporation. Allen produces some of the video segments and helps identify topics for future Brain Bites.

Allen said that future Brain Bites could answer questions such as "Why do astronauts train underwater? What's a launch window? What would I weigh on Mars? What time is it in space?"

Visit Brain Bites at spaceflight.nasa.gov/brainbite.



Rocket Science at Home

Rocket Science at Home (RSAH), an offshoot of NASA Brain Bites, is designed to help kids explore rocket science. An impossible task? Not really – as the RSAH Web site puts it, "Rocket science is really just basic principles working together."

"We hope that kids will use it as a stepping-stone to exploring science on their own," Phil West said. West worked on this outreach project while working in JSC's Public Affairs Office and now serves as JSC's Deputy Education Director. "Kids might not beg Mom and Dad to do a 'lesson plan' on Saturday morning, but they might want to build something in the garage. This can be a less intimidating, more friendly way to explore a concept."

The current RSAH experiment focuses on hovercraft. The simpler version of the experiment involves creating a tabletop hovercraft with a compact disc and a balloon, while the more advanced version helps kids – with adult supervision – make a craft they can actually ride. Both are hands-on physics lessons that stem from the Brain Bite about NASA's Precision Air-Bearing Facility.

Future RSAH modules will stem from corresponding Brain Bites. Visit RSAH at spaceflight.nasa.gov/brainbite/rocketscience.



Astronaut Don Pettit, Expedition 6 NASA ISS Science Officer, uses a drill to perform in-flight maintenance in the Destiny laboratory on the ISS. Pettit is also demonstrating a physics concept featured in a NASA Brain Bite. The Brain Bite explains to students that turning a bolt in space is no easy feat: astronauts must steady themselves – as Pettit is doing – to avoid being spun by the drill in the microgravity environment.

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JSC scientists have their names in the stars

By Cathy Watson and Kendra Ceule

Marilyn Lindstrom is #5281, David McKay is #6111 and Mike Zolensky is #6030. No, those are not these employees' PIN numbers – they are the numbers of the asteroids that bear their names.

The naming of asteroids is the responsibility of the Small Bodies Names Committee of the International Astronomical Union (IAU). Nearly 12,000 small bodies have been discovered so far in Earth's solar system and more than 10,000 of those have been named. Several past and present Johnson Space Center employees have been among those people honored with asteroid names, including the following:

Don Bogard:
asteroid name 'Bogard,' #4794

Bogard, Chief Scientist for Research on Astromaterials for the Astromaterials Research and Exploration Science (ARES) office, has worked at JSC since 1968. His asteroid was discovered in 1988.

Everett Gibson:
asteroid name 'Everett,' #14593

Gibson works at JSC as a Planetary Geochemist. He is the only U.S. scientist on the European Space Agency's Beagle2 Science Team.

"Having an asteroid named for your scientific accomplishments is one great honor by your colleagues," Gibson said.

Marilyn Lindstrom:
asteroid name 'Lindstrom,' #5281

Lindstrom has worked with meteorites for most of her NASA career and got her asteroid in 2000. Lindstrom is now a Program Scientist in the Solar

System Exploration Division of NASA Headquarters' Office of Space Science.

"When I was reassigned after 14 years as meteorite curator, I felt honored to receive two very special gifts from NASA's partners," Lindstrom said. "The Smithsonian Institution and National Science Foundation named an asteroid and a ridge in Antarctica after me."

David McKay:
asteroid name 'Davemckay,' #6111

McKay is Chief Scientist for Astrobiology in the ARES office and got his asteroid in 2002. His IAU citation mentions his years of work on lunar samples as well as the positive effect his research on Martian meteorites has had on planetary research.

"It was an unexpected but very high honor to have an asteroid named after me," McKay said. "If it ever crashes into Earth, I will probably get the blame, but in the meantime it is very nice to have it out there orbiting the Sun for perhaps the next few billion years."

Dave Mittlefehldt:
asteroid name 'Mittlefehldt,' #5760

Mittlefehldt, Planetary Scientist, has been studying meteorites at JSC since 1985. He has made two trips to the Antarctic to search for meteorite samples.

"My first thought when it was announced was 'I hope they spelled my name right,'" Mittlefehldt said. "My second thought was a replay of the scene in 'Wayne's World' when Wayne Campbell and Garth Algar prostrate themselves in front of Alice Cooper and say 'We're not worthy!'" After these

initial reactions, it finally sunk in that the family name will be written in history for as long as astronomical records are kept. It's quite a humbling thought. I am deeply honored."

Faith Vilas:
asteroid name 'Vilas,' #3507

Vilas is a Planetary Astronomer studying the surface mineralogy of asteroids from telescopic reflectance spectra. She is the U.S. representative to the near-infrared spectrograph science team on the Japanese MUSES-C mission that will return a sample from a near-Earth asteroid. She is also one of the discoverers of the rings of Neptune.

"Cool!" said Vilas when she learned of her asteroid.

Mike Zolensky:
asteroid name 'Zolensky,' #6030

Zolensky has worked at JSC since 1983, specializing in meteorites and interplanetary dust particles (samples of asteroids and comets). He got his asteroid name in 2002.

"It's a real honor, but to put things in perspective, many rock stars and politicians have asteroids named for them as well," Zolensky said.

Herbert Zook:
asteroid name 'Zook,' #14267

Zook (1932-2001) was a Planetary Scientist at JSC who "advanced the understanding of the interplanetary dust complex," according to his IAU citation. Zook studied meteoroid orbital evolution, collisions, resonant orbit interactions, radiation pressure and electromagnetic effects.



Asteroids have fascinated scientists and skygazers alike ever since the first one, Ceres, was discovered on Jan. 1, 1801. Two-hundred years later, in February 2001, NASA's Near Earth Asteroid Rendezvous (NEAR) spacecraft became the first spacecraft to land on an asteroid. Today, several asteroids are named after JSC employees -- including the STS-107 crew and the scientists listed above. This artist's rendering of NEAR was produced for NASA by Pat Rawlings of Science Applications International Corporation.



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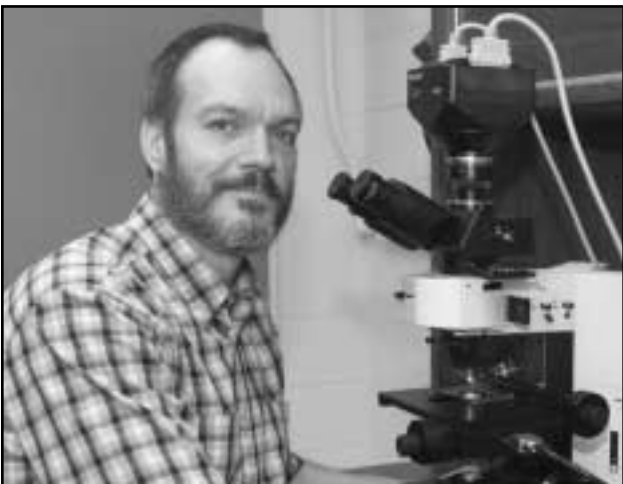
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Asteroids dedicated to STS-107 crew

The final crewmembers of the Space Shuttle Columbia were memorialized in the cosmos August 6 when seven asteroids orbiting the Sun between Mars and Jupiter were named in their honor.

The STS-107 crew – Commander Rick Husband; Pilot Willie McCool; Mission Specialists Mike Anderson, Kalpana “K.C.” Chawla, Dave Brown and Laurel Clark; and Israeli payload specialist Ilan Ramon – will have celestial memorials easily found from Earth.

The names, proposed by NASA’s Jet Propulsion Laboratory (JPL) in Pasadena, Calif., were recently approved by the International Astronomical Union.

The seven asteroids were discovered in 2001 at the Palomar Observatory near San Diego by former JPL astronomer Eleanor F. Helin, who retired in July 2002. The seven asteroids range in diameter from five to seven kilometers (3.1 to 4.3 miles).

“Asteroids have been around for billions of years and will remain for billions more,” Dr. Raymond Bamberg, Principal Investigator of JPL’s Near-Earth Asteroid Tracking System, said. “I like to think that in the years, decades and millennia ahead, people will look to the heavens, locate these seven celestial sentinels and remember the sacrifice made by the Columbia astronauts.”

FROM TOP, LEFT TO RIGHT
Don Bogard, Everett Gibson,
Marilyn Lindstrom, David McKay,
Dave Mittlefehldt, Faith Vilas,
Mike Zolensky and Herbert Zook.

Photos by the JSC Photographers

The International Space Station at five

This month marks the fifth anniversary of the birth of the International Space Station. While crews have only been living and working aboard the Station since November 2000, it has been five years since the first ISS element – the Zarya Control Module – was launched from Baikonur Launch Complex in Kazakhstan in November 1998.

Zarya is a true symbol of United States/Russian cooperation. The module was U.S.-funded and built under a subcontract to The Boeing Company but was constructed in Moscow and has a Russian name. Zarya translates to “Sunrise,” which is appropriate since the module symbolized the dawning of an exciting new era of international cooperation in space – not just between the United States and Russia but among all 16 ISS partner countries.



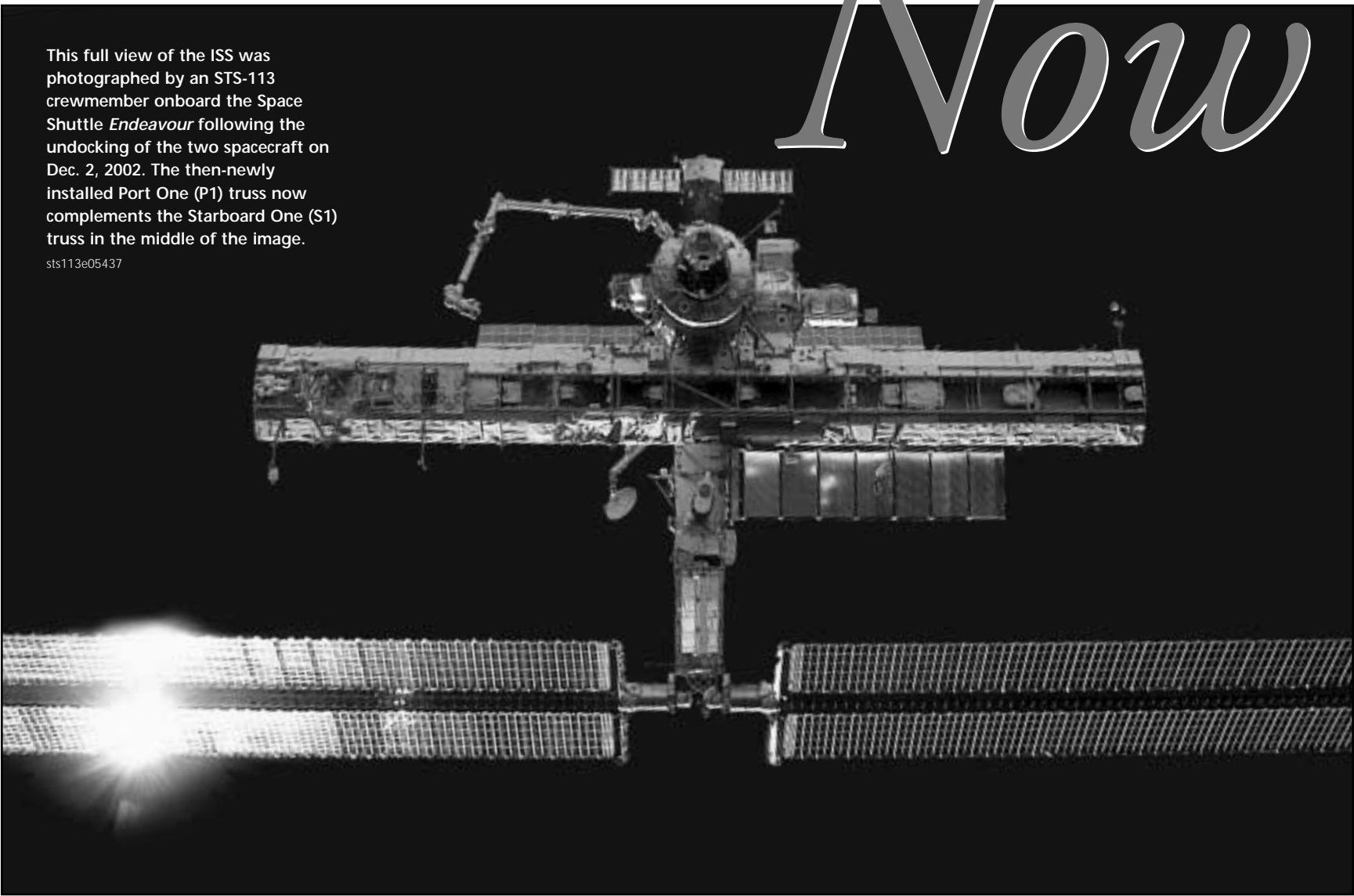
Zarya approaches the Space Shuttle *Endeavour* and the U.S.-built Node 1, also called Unity. Inside *Endeavour's* cabin, the STS-88 crew readied the remote manipulator system for Zarya capture as they awaited the rendezvous.

sts088-719-059

Then
&
Now

This full view of the ISS was photographed by an STS-113 crewmember onboard the Space Shuttle *Endeavour* following the undocking of the two spacecraft on Dec. 2, 2002. The then-newly installed Port One (P1) truss now complements the Starboard One (S1) truss in the middle of the image.

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SPACE CENTER

Roundup

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